

Simple anterior orthodontics with Inman Aligner – selected case studies

The increased patient demand for straighter teeth, coupled with a paradigm shift away from aggressive tooth preparation, has made removable orthodontics an important tool for the aesthetic dentist, says **Lennart Jacobsen**

Removable orthodontic appliances were once widely used to correct a variety of malocclusions. As techniques associated with fixed appliances developed and became the main preference of orthodontists, the role of the removable appliance diminished.

However, in recent years the popularity of the removable appliance has returned with a vengeance. It provides patients who would normally opt out of orthodontic procedures on the grounds of lengthy treatment time, compromised aesthetics and cost, a real alternative to ordinary fixed braces.

A study from Sweden indicates a number of cost-benefit advantages to treating patients with removable appliances in general dental practices, rather than through fixed appliances at specialist orthodontists (Laag, Ström, 2009). The conclusion of this study is significant, since a popular choice amongst aesthetic dentists in the UK is removable orthodontics.

A paradigm shift

Although the dental profession owes much to the late GV Black, it has long been widely accepted that his philosophy of 'extension for prevention' no longer has a place in modern dentistry (Murdoch-Kinch, McLean, 2003).

These days, 'minimally invasive' is the new black in operative dentistry. Dentists today must carefully consider the long-term consequences of any irreversible procedure, and inform patients of the benefits and risks involved.

This becomes especially important when patients are seeking aesthetic dentistry where elective procedures are undertaken with little or no pathologic indication.

Recent orthodontic developments such as the Inman Aligner have made it possible for the aesthetic dentist to dramatically improve the appearance of anterior teeth in a relatively short space of time using discreet removable appliances. This approach embraces the concept of 'minimally invasive' and, at the same time, actively involves the patient in treatment, giving them the feeling

of being in control and taking ownership for the success of their treatment. This has been shown to be of great significance when measuring patient satisfaction concerning treatment results (Mollov et al, 2010).

The long-term benefits of minimally invasive dentistry in the aesthetic zone are obvious. In most cases, alignment or pre-alignment of the anterior teeth will result in much less, if any, tooth preparation. The majority of mild anterior malocclusions can be corrected using removable orthodontics alone, sometimes followed by whitening and/or composite bonding.

For cases that do need finishing with veneers, pre-alignment means that preparation can be limited to the enamel, resulting in better predictability with pure enamel bonding. It also greatly reduces the risk of endodontic complications (Toreskog, 2002).

Inman Aligner

The Inman Aligner is one of the most popular removable appliances among dentists in the UK. It is constructed on a stone cast on which model surgery has been performed. On the model, the anterior teeth have been set up in an ideal arch form, and the aligner fabricated to move the teeth into this position (Inman et al, 2008) (Figures 1a-1c).

The risk of over-correction or unintended tooth movements is virtually non-existent, as the aligner will turn into a passive retainer once the desired tooth position has been achieved.

The orthodontic effect of the aligner is generated by four NiTi coil springs that create light, steady reciprocal forces to the incisors and canines via lingual and labial clear acrylic bars (Figure 2). In effect, the anterior teeth are gently 'squeezed' into alignment.

This continuous force application is superior to the interrupted force delivered by some other removable appliances, and results in more effective orthodontic movements and shorter treatment time (Proffit, 2007).

However, the orthodontic effect is limited to tipping and



Figure 1a: Pre-op

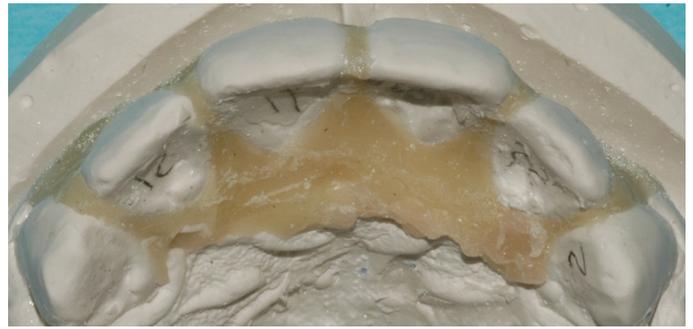


Figure 1b: Wax-up



Figure 1c: Post-op

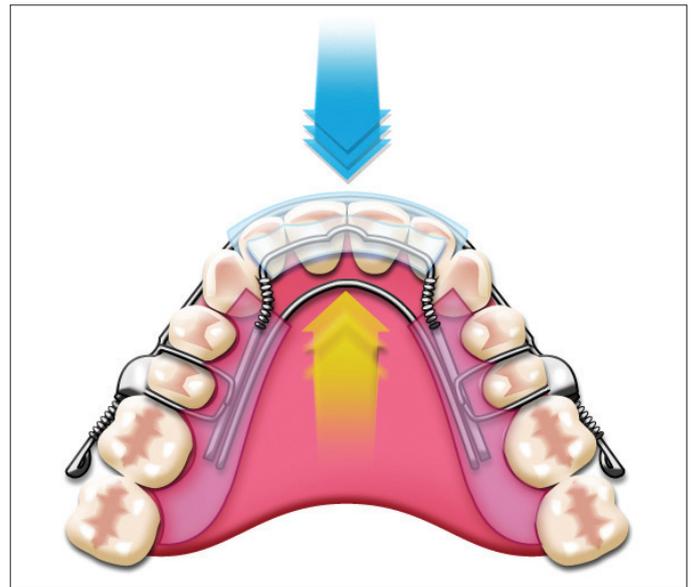


Figure 2: The orthodontic effect of the Inman Aligner

rotation of the incisors and, to a certain extent, canines. However, relative intrusion/extrusion is often seen when misaligned incisors move labially or palatally respectively.

Being a removable orthodontic appliance with the capacity of straightening upper and lower anteriors, the Inman Aligner should be used primarily on compliant adult patients with mild to moderate anterior crowding or spacing. The posterior occlusion must be well-balanced, ideally an angle class I. There should be no active periodontal disease and no TMD (Warunek, Willison, 2005).

Discussion

Using removable orthodontics, such as the Inman Aligner, can be a simple and effective way for GDPs to straighten anterior teeth on the right case types. It also greatly reduces the need for any tooth preparations in aesthetic dentistry.

Other comprehensive orthodontic appliances exist and should be used whenever a patient presents with more complex or profound problems, such as severe sagittal or transverse discrepancies or the need for posterior correction.

Fixed orthodontics offer greater treatment versatility and do not depend to the same extent on patient compliance as removable orthodontics.

However, for some indications, removable orthodontic appliances actually have significant advantages over fixed appliances (Issacson, Muir, Reed, 2003) and usually the treatment time with removable appliances is shorter than with fixed (Tang, Wei, 1990).

Studies in dentistry and other fields of medicine have shown that treatment success is closely linked to the shared responsibility of treatment and aftercare between doctor and patient (Tang et al, 1997). Given that the treatment result of the removable appliance is heavily linked to the

Case one: upper crowding



Figure 1a: Pre-op



Figure 1b: 10 weeks



Figure 2a: Pre-op



Figure 2b: 10 weeks



Figure 3a: Pre-op



Figure 3b: 10 weeks

Case two: orthodontic relapse



Figure 1a: Pre-op



Figure 1b: 12 weeks



Figure 2a: Pre-op



Figure 2b: 12 weeks



Figure 3a: Pre-op



Figure 3b: 12 weeks

Case three: angle class II div. 2



Figure 1a: Pre-op



Figure 1b: 12 weeks



Figure 2a: Pre-op



Figure 2b: 12 weeks



Figure 3a: Pre-op



Figure 3b: 12 weeks



Figure 4a: Pre-op



Figure 4b: 12 weeks

responsibility and compliance of the patient, it might be interesting to compare patient satisfaction from treatment with fixed versus removable appliances in similar anterior malocclusions.

Conclusion

There is little doubt that the future belongs to minimally invasive dentistry. The literature suggests that treating some malocclusions with removable appliances in general dental practice could be the more cost-effective choice. It also

links treatment success and patient satisfaction to the active involvement and shared responsibility of the patient.

On the right case types, treatment with the Inman Aligner fulfils all of the above, and in addition, marries optimal continuous force application with the convenience of a removable appliance.

An aesthetic dentist today should by definition also be an ethical dentist. Helping patients to achieve a more beautiful smile by simple anterior orthodontics rather than invasive preparations is not only possible, it's the right thing to do.

Case four: large diastema



Figure 1a: Pre-op



Figure 1b: 10 weeks



Figure 2a: Pre-op



Figure 2b: 10 weeks



Figure 3a: Pre-op



Figure 3b: 10 weeks



Figure 4a: Pre-op



Figure 4b: 10 weeks



Figure 5a: Pre-op



Figure 5b: 10 weeks

Case studies

Case one: upper crowding

This 22-year-old female was concerned about the appearance of her upper front teeth.

The patient did not want fixed appliances and found clear aligners too expensive.

A standard Inman Aligner corrected upper crowding in 10 weeks, after which a palatal bonded wire retainer was placed (case one, Figures 1a-3b).

Case two: orthodontic relapse

This 24-year-old female was concerned about the appearance of her lower anterior teeth.

She had previously undergone orthodontic treatment but the lower incisors had relapsed due to lack of long-term retention. Clinical examination found mild to moderate chronic gingivitis associated with lower anterior crowding and the patient reported difficulties keeping lower incisors sufficiently clean.

Different orthodontic options were discussed and, in the end, the patient opted for an Inman Aligner. A thorough hygiene regime was initiated and once the periodontal situation had improved, the lower incisors were straightened in 12 weeks using a standard Inman Aligner. A lingual bonded retainer was fitted to reduce risk of future orthodontic relapse. Follow-up examinations showed greatly improved periodontal health around the lower incisors (case two, Figures 1a-3b).

Case three: angle class II, div. 2

This 26-year-old male was concerned about appearance of upper front teeth. The patient had a stable angle class II div. 2 occlusion, and the retroclination of the central incisors presented a classic sagittal compensation with proclination of the laterals.

Referral to an orthodontist for comprehensive correction of the sagittal discrepancy was advised, but the patient wanted his upper front teeth straightened as quickly as possible and refused to wear any fixed braces.

The patient found treatment with clear aligners too expensive and too lengthy. A standard Inman Aligner straightened the upper incisors to the patient's satisfaction in 12 weeks. A wire retainer was bonded to the palatal surfaces of the upper anteriors to avoid orthodontic relapse (case three, Figures 1a-4b).

Case four: large diastema

This 24-year-old female was concerned about a large midline diastema. The patient initially presented wanting veneers or crowns to close the midline space. She was not interested in orthodontic treatment and refused to have fixed braces.

A quick composite mock-up was done to illustrate the unfavorable proportions of veneering over such a large space. This convinced the patient that orthodontic treatment should be attempted, at least as a pre-positioning tool before possibly veneering upper front teeth.

An Inman Aligner was fabricated and worn by the

patient for 10 weeks. For the last two weeks, the palatal component of the aligner was removed to allow complete closure of the midline diastema. An Essix retainer was made and worn full-time for the first four weeks, after which the patient went into night retention only (case four, Figures 1a-5b). [PD](#)

References

- Inman DP, Qureshi T et al (2008) *The Inman Aligner Clinical Manual*. Coral Springs, FL: Inman Orthodontic Laboratories Inc
- Issacson KG, Muir JD, Reed RT (2003) *Removable Orthodontic Appliances*. Bodmin, Cornwall: MPG Books Ltd
- Laag B, Ström C (2009) Comparisons of similar patients treated by general dental clinicians and orthodontic specialists. Outcome and economical considerations. *Swed Dent J* 33(2): 67-73
- Mollov ND, Lindhauer SJ et al (2010) Patient attitudes toward retention and perceptions of treatment success. *Angle Orthodontist* 80(4): 656-61
- Murdoch-Kinch CA, McLean ME (2003) Minimally invasive dentistry. *J Am Dent Assoc* 134(1): 87-95
- Proffit WR (2007) *Contemporary Orthodontics* (Fourth Edition). St Louis, MO: Mosby
- Tang ELK, Wei SHY (1990) Assessing treatment effectiveness of removable and fixed orthodontic appliances with the occlusal index. *Am J Orthod Dentofacial Orthop* 98(6): 550-6
- Tang PC et al (1997) Meeting the information needs of patients: results form a patient focus group. Proc AMIA Annu Fall Symp 672-76
- Toreskog S (2002) The minimally invasive and aesthetic bonded porcelain technique. *Int Dent J* 52: 353-63
- Warunek SP, Willison BD (2005) Incisor alignment with the Inman Aligner. *J Cosm Dent* 4(20): 80-92

[Comments to pd@fmc.co.uk](mailto:pd@fmc.co.uk)

.....

Lennart Jacobsen DDS is an associate dentist at Aqua Dental Spa in London, where he practises aesthetic and restorative dentistry. He qualified from the University of Aarhus, Denmark, which is internationally-renowned for its comprehensive orthodontic training programme. Lennart has a special interest in simple anterior orthodontics using removable or fixed appliances as definitive or pre-prosthetic treatment. A lecturer on this subject, Lennart has written articles promoting an ethical approach to aesthetic dentistry using removable orthodontic appliances.